

Application No.: 09/517,579
Amendment Dated: July 31, 2003
Reply to Office Action of: May 1, 2003

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. (Canceled)
2. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 5, wherein said benzene or its chlorine derivative is at least one member selected from the group consisting of benzene, monochlorobenzene, dichlorobenzene and trichlorobenzene.
3. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 5, wherein the voltage is applied to the element in a dry atmosphere in an open condition.
4. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 5, wherein the benzene or its chlorine derivative is contained in an amount of from 0.1 to 30 wt% in the organic electrolyte.
5. (Currently Amended) A method for producing an electric double layer capacitor, comprising:
impregnating an element comprising
positive and negative electrodes facing each other with a separator interposed

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between them,
with an organic electrolyte comprising
benzene or its chlorine derivative having at least one hydrogen atom of
benzene substituted by a chlorine atom,
said organic electrolyte being capable of forming an electric double layer on the surface of the
electrodes to store electric charge,
said impregnating resulting in substituting water adsorbed to a carbonaceous material
contained in said positive and negative electrodes with said benzene or its chlorine derivative,
to obtain desorbed water;
applying a voltage to the element in a dry atmosphere having a dew point of not more
than -20°C, thereby expelling said desorbed water from said element; and
maintaining said element at reduced pressure;
wherein said positive and negative electrodes comprise said carbonaceous material
having a specific surface area of from 100 to 3,000 m²/g; and
wherein the organic electrolyte further comprises
a) a solvent selected from the group consisting of ethylene carbonate, propylene
carbonate, butylene carbonate, dimethyl carbonate, ethyl methyl carbonate, diethyl carbonate,
acetonitrile, glutaronitrile and a mixture thereof; or
b) a solvent mixture of sulfolane and a solvent selected from the group consisting of
ethylene carbonate, dimethyl carbonate, ethyl methyl carbonate, diethyl carbonate,
acetonitrile, glutaronitrile and a mixture thereof; or

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c) a solvent mixture of a sulfolan derivative and a solvent selected from the group consisting of ethylene carbonate, dimethyl carbonate, ethyl methyl carbonate, diethyl carbonate, acetonitrile, glutaronitrile and a mixture thereof.

6. (Canceled)

7. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 5, wherein a voltage of at least 2.5V is applied to the element at a temperature of from 15 to 85°C.

8. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 5, wherein the application of a voltage to the element comprises the following steps A and B:

Step A: a step of applying a voltage across the positive and negative electrodes by a DC power source, and

Step B: a step of applying a voltage by inversely connecting the positive and negative electrodes to the DC power source as compared with step A.

9. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 5, wherein the organic electrolyte further comprises a salt comprising a cation represented by $R^1R^2R^3R^4N^+$ or $R^1R^2R^3R^4P^+$, and wherein each of R^1 , R^2 , R^3 and R^4

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which are independent of one another, is a C₁₋₆ alkyl group or a C₆₋₁₀ aryl group, and an anion of BF₄⁻, PF₆⁻, CF₃SO₃⁻, AsF₆⁻, N(SO₂CF₃)₂⁻ or ClO₄⁻.

10. (Canceled)

11. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 5, wherein after the application of a voltage to the element, the element is maintained under a reduced pressure of at most 160 Torr.

12. (Currently Amended) A method for producing an electric double layer capacitor, comprising:

impregnating an element comprising

positive and negative electrodes facing each other with a separator interposed between them,

with an organic electrolyte comprising

benzene or its chlorine derivative having at least one hydrogen atom of benzene substituted by a chlorine atom,

said organic electrolyte being capable of forming an electric double layer on the surface of the electrodes to store electric charge,

said impregnating resulting in substituting water adsorbed to a carbonaceous material contained in said positive and negative electrodes with said benzene or its chlorine derivative,

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to obtain desorbed water;

applying a voltage to the element in a dry atmosphere in an open condition, said dry atmosphere having a dew point of not more than -20°C, thereby expelling said desorbed water from said element; and

maintaining said element at reduced pressure;

wherein said positive and negative electrodes comprise said carbonaceous material having a specific surface area of from 100 to 3,000 m²/g; and

wherein the organic electrolyte further comprises

a) a solvent selected from the group consisting of ethylene carbonate, propylene carbonate, butylene carbonate, dimethyl carbonate, ethyl methyl carbonate, diethyl carbonate, acetonitrile, glutaronitrile and a mixture thereof; or

b) a solvent mixture of sulfolane and a solvent selected from the group consisting of ethylene carbonate, dimethyl carbonate, ethyl methyl carbonate, diethyl carbonate, acetonitrile, glutaronitrile and a mixture thereof; or

c) a solvent mixture of a sulfolan derivative and a solvent selected from the group consisting of ethylene carbonate, dimethyl carbonate, ethyl methyl carbonate, diethyl carbonate, acetonitrile, glutaronitrile and a mixture thereof.

13. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 12, wherein said benzene or its chlorine derivative is at least one member selected from the group consisting of benzene, monochlorobenzene, dichlorobenzene

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and trichlorobenzene.

14. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 12, wherein the benzene or its chlorine derivative is contained in an amount of from 0.1 to 30 wt% in the organic electrolyte.

15. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 12, wherein a voltage of at least 2.5V is applied to the element at a temperature of from 15 to 85°C.

16. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 12, wherein the application of a voltage to the element comprises the following steps A and B:

Step A: a step of applying a voltage across the positive and negative electrodes by a DC power source, and

Step B: a step of applying a voltage by inversely connecting the positive and negative electrodes to the DC power source as compared with step A.

17. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 12, wherein the organic electrolyte further comprises a salt comprising a cation represented by $R^1R^2R^3R^4N^+$ or $R^1R^2R^3R^4P^+$, and wherein each of R^1 , R^2 ,

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R^3 and R^4 which are independent of one another, is a C_{1-6} alkyl group or a C_{6-10} aryl group, and an anion of BF_4^- , PF_6^- , $CF_3SO_3^-$, AsF_6^- , $N(SO_2CF_3)_2^-$ or ClO_4^- .

18. (Canceled)

19. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 12, wherein after the application of a voltage to the element, the element is maintained under a reduced pressure of at most 160 Torr

20. (Currently Amended) A method for producing an electric double layer capacitor, comprising:

impregnating an element comprising

positive and negative electrodes facing each other with a separator interposed between them,

with an organic electrolyte comprising

benzene or its chlorine derivative having at least one hydrogen atom of benzene substituted by a chlorine atom,

said organic electrolyte being capable of forming an electric double layer on the surface of the electrodes to store electric charge,

said impregnating resulting in substituting water adsorbed to a carbonaceous material contained in said positive and negative electrodes with said benzene or its chlorine derivative,

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to obtain desorbed water;

applying a voltage to the element in a dry atmosphere having a dew point of not more than -20°C, thereby expelling said desorbed water from said element; and

maintaining said element at reduced pressure of at most 160 Torr;

wherein said positive and negative electrodes comprise said carbonaceous material having a specific surface area of from 100 to 3,000 m²/g; and

wherein the organic electrolyte further comprises

a) a solvent selected from the group consisting of ethylene carbonate, propylene carbonate, butylene carbonate, dimethyl carbonate, ethyl methyl carbonate, diethyl carbonate, acetonitrile, glutaronitrile and a mixture thereof; or

b) a solvent mixture of sulfolane and a solvent selected from the group consisting of ethylene carbonate, dimethyl carbonate, ethyl methyl carbonate, diethyl carbonate, acetonitrile, glutaronitrile and a mixture thereof; or

c) a solvent mixture of a sulfolan derivative and a solvent selected from the group consisting of ethylene carbonate, dimethyl carbonate, ethyl methyl carbonate, diethyl carbonate, acetonitrile, glutaronitrile and a mixture thereof.

21. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 20, wherein said benzene or its chlorine derivative is at least one member selected from the group consisting of benzene, monochlorobenzene, dichlorobenzene and trichlorobenzene.

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22. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 20, wherein the voltage is applied to the element in a dry atmosphere in an open condition.

23. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 20, wherein the benzene or its chlorine derivative is contained in an amount of from 0.1 to 30 wt% in the organic electrolyte.

24. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 20 wherein a voltage of at least 2.5V is applied to the element at a temperature of from 15 to 85°C.

25. (Previously Presented) The method for producing an electric double layer capacitor according to Claim 20 wherein the application of a voltage to the element comprises the following steps A and B:

Step A: a step of applying a voltage across the positive and negative electrodes by a DC power source, and

Step B: a step of applying a voltage by inversely connecting the positive and negative electrodes to the DC power source as compared with step A.

26. (Previously Presented) The method for producing an electric double layer

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capacitor according to Claim 20 wherein the organic electrolyte further comprises a salt comprising a cation represented by $R^1R^2R^3R^4N^+$ or $R^1R^2R^3R^4P^+$, and wherein each of R^1 , R^2 , R^3 and R^4 which are independent of one another, is a C_{1-6} alkyl group or a C_{6-10} aryl group, and an anion of BF_4^- , PF_6^- , $CF_3SO_3^-$, AsF_6^- , $N(SO_2CF_3)_2^-$ or ClO_4^- .

27. (Canceled)

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BASIS FOR THE AMENDMENT

Claims 5, 12 and 20 have been amended as supported at page 7, lines 23-25 of the specification.

No new matter is believed to have been added by entry of this amendment. Entry and favorable reconsideration are respectfully requested.

Upon entry of this amendment Claims 2-5, 7-9, 11-17 and 19-26 will now be active in this application.